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EXAMINER	
SILVERMAN, ERIC E	
ART UNIT	PAPER NUMBER
1618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,818	MCNALLY-HEINTZELMAN ET AL.	
	Examiner	Art Unit	
	Eric E. Silverman, PhD	1618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-8,10-13 and 32-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-8,10-13 and 32-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicants' amendments, filed 2/19/2007, have been received. Claims 1, 2, 5 – 8, 10 – 13, and 32 – 52 are pending in this action.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, and 32 - 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Pitts et al. in *Photochemistry and Photobiology*, 2002, 76(2) 135 - 144.

This rejection is being made on the basis of the components of the composition. Pitts discloses a composition containing all of the instantly required ingredients, and so anticipates the claims.

Pitts discloses the use of rose Bengal derivatives to induce light activated cross-linking of collagen (page 139, second col.) Note that collagen is a scaffold (see US 5,800,357 and instant claim 6), and also a light-activated adhesive. Pitts also discloses that similar compositions were made with FD&C Yellow # 10 and Green #3 instead of the rose Bengal derivative. Pitts thus has all of the requisite components of instant claim 1, namely, a scaffold (collagen), a light activated adhesive (collagen) and a food coloring (Yellow # 10 or Green # 5). With regard to claim 32, the presence of surface irregularities is understood to be an inherent feature of the scaffold material, because nothing is done in Pitts to smooth the collagen. With regard to claim 33, this is product by process claim and the record does not indicate that the processes of molding, drilling, or punching imbue the scaffold with any distinct or patentable features. With

regard to claims 34 and 35, collagen is a hemostatic agent (See US 5,331,092), and as such the composition is adapted to deliver a hemostatic agent to a wound if the composition were applied to a wound. With regard to claims 36 and 37, these claims recite properties of claim 1 which are understood to be inseparable from the composition of claim 1.

Claims 6, 8, 40, 42 - 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Moser et al, 2001 for reasons of record and those discussed below.

Note that Moser teaches the use of light absorbers with a serum albumin adhesive and a PLGA scaffold.

With regard to the newly added claim limitations, Moser teaches use of a PLGA scaffold having a 85:15 lactide to glycolide ratio as in instant claim 40. See Materials and methods section. The PGLA is said to be porous, and so has surface irregularities. The PLGA is formed by molding in a petri dish, so the irregularities are commensurate with those of instant claims 42 and 43. Proteins, such as BSA, are biologically active materials, as per claim 44, and PLGA may be used as a hemostatic agent as per instant claim 45. Instant claims 45 and 47 recite either properties of the composition of claim 6. Because Moser's composition is the composition of claim 6, the properties are inherently present in Moser.

Response to Arguments

Applicants' arguments have been fully considered, but are not persuasive. Applicants argue that Moser fails to disclose the concentration range of light absorber of about 200 – 1000 microliters per 13 milliliter of deionoized water in claim 6. In

response, in Figure 1 and the Materials and Methods section, Moser discloses the use of a light absorber in concentration of 2.5 mg/mL deionized water, which is equivalent 192 microliters per 13 milliliters. This disclosed amount reads on the “about 200" of instant claims, and thus falls into the claimed range. Accordingly, Applicants argument that Moser fails to disclose this aspect of the invention has no force.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 10 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moser et al.

Some of Moser’s teachings were discussed previously. What is lacking is a teaching of the light absorber in a concentration of 600 uL / 13 mL of deionized water.

Moser also teaches that the concentration of the light absorber is a variable parameter, in that the concentration of light absorber (ICG in Moser) relates to the ultimate strength of the composition. See Discussion section. Moser also does not teach the use of 50 % bovine serum albumin (BSA).

It would have been prima facie obvious to a person of ordinary skill in the art at the time of the invention to optimize the amount of light absorber in order to obtain the strongest possible composite, or the composite with the desired strength. It is generally obvious to optimize a parameter that is recognized as results-effective. The

concentration of BSA is also recognized to be results effective. The artisan understands that the mechanism of action of Moser's compositions is that light activates the dye, which then effects cross-linking of the BSA. Because cross-linking reactions are concentration dependant, the artisan understands that variations in BSA concentration are merely optimization measures, designed to give the best result for the desired use.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 5 – 8, 10 – 13, and 32 – 52 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for compositions where the adhesive is serum albumin regardless of the light absorber, and compositions where the light absorber is one of the compounds of Figure 1 in Pitts regardless of the adhesive, does not reasonably provide enablement for other combinations of adhesive and light absorber. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. A claim is not enabled when a person of ordinary skill in the art could not make or use the invention without undue experimentation. In this case, the person of ordinary skill in the art could not use the invention without undue experimentation.

Undue experimentation is determined by an analysis of the factors enumerated in MEPEP 2164.01(a). All of these factors have been considered, and the most relevant to the claims at issue are discussed below.

1. The breadth of the claims

The claims are drawn to compositions having a light activated adhesive, a light absorber, and a scaffold. A variety of scaffolds are well known in the art, and the nature of the scaffold does not figure into this rejection.

Independent claim 1, and claims dependant therefrom, require that the light absorber be red, blue, or green food coloring, and are generic with respect to the nature of the light activated adhesive.

Independent claim 6 and claims dependant thereon are generic with respect to both the nature of the light absorber and the nature of the adhesive. There are two exceptions to this: claim 13 requires that the light absorber be green food coloring, comprised of blue #1 and yellow # 5, and claim 41 which requires that the adhesive include 50% w/v bovine serum albumin. Note however that claim 13 is generic with respect to the adhesive, and that claim 41 is generic with respect to the light absorber.

Independent claim 48 and claims dependant thereon require that the light absorber be red, blue, or green food coloring, and are generic with respect to the nature of the light activated adhesive. The only exception to this is claim 52, which requires that the adhesive include 50% bovine serum albumin.

Note that the Applicant has elected green food coloring as the species of light absorber for examination.

2. The nature of the invention

Applicants have demonstrated that one light activated adhesive, bovine serum albumin, can be activated with food coloring and used for wound healing purposes as known in the art after said activation with food coloring.

3. The state of the prior art

The prior art recognizes the mechanism by which light-activated adhesives (sometimes known as protein solders) function. An appropriate light absorber, when admixed with the adhesive, is activated to an excited state by absorption of photons (light energy). The activated light absorber undergoes a reaction with the adhesive (either directly or via creation of singlet oxygen), causing cross-linking of the adhesive. The cross-linked adhesive is harder than the non-cross linked adhesive, resulting in an action much like epoxy glue, wherein the hardening of the adhesive through cross linking causes adhesion. If the adhesive does not cross link, then it does not function to bind together two items.

The prior art recognizes that different adhesives may be easier or harder to cross-link. For example, the Pitts reference teaches that bovine serum albumin is particularly easy to cross link. Pitts at 139. This allegation is in accord with other art of record, which shows that bovine serum albumin is cross linkable by a variety of light absorbers. Other adhesive, such as collagen, are more difficult to crosslink. Id. Whether or not a particular adhesive will cross link depends largely on the light absorber used. Pitts shows that neither green nor yellow food coloring can cross link collagen.

Id. On the contrary, collagen can only be cross linked by using specially designed dyes, such as those in figure 1 of Pitts.

4. The level of predictability in the art vis-à-vis the claimed invention

The art shows that it is generally not possible to predict which light absorbers will cross link any particular light activated adhesive. For example, green food coloring does not cross link collagen, although the artisan would not know this absent the experimentation of Pitts. Given that bovine serum albumin can be cross linked easily, and that collagen cannot be cross linked except with the particular light absorbers in Figure 1 of Pitts, the art must be considered unpredictable. It is not possible to determine, absent trial and error experimentation, which light absorbers will be effective to cross link any given light activated adhesive; conversely, it is not possible to determine which light activated adhesives can be cross linked by any given light absorber.

5 The direction provided by the inventor and the existence of working examples

The inventor shows that bovine serum albumin is cross linkable by various food colorings. However, the inventor does not show that any other light activated adhesive that can be cross linked by the claimed food colorings. Nor does the disclosure show any light absorber that can cross link adhesives other than bovine serum albumin.

6. The quantity of experimentation required to use the invention

In order to use the invention, the artisan would have to determine which light absorbers are able to cross link any given adhesive. For the elected green food coloring, the artisan would have to determine which adhesives this light absorber can

cross link. Given that green food coloring is disclosed to cross link bovine serum albumin, but is known not to cross link other adhesives, the artisan has no way of knowing which adhesives would be cross linked (remember that the composite will only be useable if the adhesive used can be cross linked with the light absorber). Accordingly, the artisan wishing to use the invention would need to undergo trial and error experimentation to make this determination.

Such trial and error experimentation essentially involves starting the inventive process from scratch, and the experimentation required is undue.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 recites the limitation "the green food coloring" in claim 6. There is insufficient antecedent basis for this limitation in the claim.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric E. Silverman, PhD whose telephone number is (571)272-5549. The examiner can normally be reached on Monday to Thursday 7:00 am to 5:00 pm and Friday 7:00 am to noon.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Hartley can be reached on 571 272 0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric E Silverman, PhD/
Examiner, Art Unit 1618

Eric E. Silverman, PhD
Art Unit 1618